

## Claims

[c1] What is claimed is:

1.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer, comprising at least the steps of: forming an LED stack over a first substrate; forming a first reaction layer over said LED stack; forming a reflective layer over a second substrate; forming a second reaction layer over said reflective layer; and holding together said first reaction layer and said second reaction layer by means of a transparent adhesive layer.

[c2] 2.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 1, wherein said reflective layer is a reflective metal layer.

[c3] 3.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 2, wherein said reflective metal layer comprises at least a material selected from the group consisting of In, Sn, Al, Au, Pt, Zn, Ag, Ti, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, AuZn, and the like.

- [c4] 4.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 1, wherein said reflective layer is a reflective oxide layer.
- [c5] 5.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 4, wherein said reflective oxide layer comprises at least a material selected from the group consisting of SiNx, SiO<sub>2</sub>, Al2O3, TiO2, MgO, and the like.
- [c6] 6.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 1, wherein said transparent adhesive layer comprises at least a material selected from the group consisting of polyimide (PI), benzocyclobutene (BCB), perfluorocyclobutane (PFCB), and the like.
- [c7] 7.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 1, wherein said first reaction layer or said second reaction layer comprises at least a material selected from the group consisting of SiNx, Ti, Cr, and the like.
- [c8] 8.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 1, wherein forming a reflective layer over a sec-

ond substrate comprises the steps of forming a semi-conductor stack over said second substrate and forming a reflective layer over said semiconductor stack.

- [c9] 9.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 1, further comprising the step of removing said first substrate.
- [c10] 10.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer, comprising at least the steps of: forming an LED stack over a first substrate; forming a first reaction layer over said LED stack; forming a second reaction layer over a reflective metal substrate; and holding together said first reaction layer and said second reaction layer by means of a transparent adhesive layer.
- [c11] 11.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 10, wherein said reflective metal substrate comprises at least a material selected from the group consisting of Sn, Al, Au, Pt, Zn, Ag, Ti, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, AuZn, and the like.
- [c12] 12.A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according

to claim 10, wherein said transparent adhesive layer comprises at least a material selected from the group consisting of polyimide (PI), benzocyclobutene (BCB), perfluorocyclobutane (PFCB), and the like.

- [c13] 13. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 10, wherein said first reaction layer or said second reaction layer comprises at least a material selected from the group consisting of  $\text{SiN}_x$ , Ti, Cr, and the like.
- [c14] 14. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 10, wherein the step of forming a second reaction layer over a reflective metal substrate comprises the steps of forming a reflective layer over said reflective metal substrate and forming a second reaction layer over said reflective layer.
- [c15] 15. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 10, further comprising the step of removing said first substrate.
- [c16] 16. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer, comprising at least the steps of: forming an LED stack over a first

substrate; forming a reflective layer over said LED stack; forming a first reaction layer over said reflective layer; forming a second reaction layer over a second substrate; and holding together said first reaction layer and said second reaction layer by means of an adhesive layer.

- [c17] 17. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 16, wherein said reflective layer is a reflective metal layer.
- [c18] 18. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 16, wherein said reflective layer is a reflective oxide layer.
- [c19] 19. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 17, wherein said reflective metal layer comprises at least a material selected from the group consisting of In, Sn, Al, Au, Pt, Zn, Ag, Ti, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, AuZn, and the like.
- [c20] 20. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 18, wherein said reflective oxide layer comprises at least a material selected from the group consisting of

$\text{SiN}_x$ ,  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{MgO}$ , and the like.

- [c21] 21. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 16, wherein said first reaction layer or said second reaction layer comprises at least a material selected from the group consisting of  $\text{SiN}_x$ , Ti, Cr, and the like.
- [c22] 22. A method for manufacturing a light emitting diode having an adhesive layer and a reflective layer according to claim 16, further comprising the step of removing said first substrate.
- [c23] 23. A light emitting diode having an adhesive layer and a reflective layer, comprising at least: a substrate; a reflective layer formed over the substrate; a first reaction layer formed over said reflective layer; a transparent adhesive layer formed over said first reaction layer; a second reaction layer formed over said transparent adhesive layer; and an LED stack formed over said second reaction layer.
- [c24] 24. A light emitting diode having an adhesive layer and a reflective layer according to claim 23, further comprising a transparent conductive layer between said second reaction layer and said LED stack.
- [c25] 25. A light emitting diode having an adhesive layer and a reflective layer according to claim 23, wherein said re-

flective layer is a reflective metal layer.

- [c26] 26. A light emitting diode having an adhesive layer and a reflective layer according to claim 23, wherein said reflective layer is a reflective oxide layer.
- [c27] 27. A light emitting diode having an adhesive layer and a reflective layer according to claim 25, wherein said reflective metal layer comprises at least a material selected from the group consisting of In, Sn, Al, Au, Pt, Zn, Ag, Ti, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, AuZn, and the like.
- [c28] 28. A light emitting diode having an adhesive layer and a reflective layer according to claim 26, wherein said reflective oxide layer comprises at least a material selected from the group consisting of  $\text{SiN}_x$ ,  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{MgO}$ , and the like.
- [c29] 29. A light emitting diode having an adhesive layer and a reflective layer according to claim 23, wherein said transparent adhesive layer comprises at least a material selected from the group consisting of polyimide (PI), benzocyclobutene (BCB), perfluorocyclobutane (PFCB), and the like.
- [c30] 30. A light emitting diode having an adhesive layer and a reflective layer according to claim 23, wherein said first reaction layer or said second reaction layer comprises at

least a material selected from the group consisting of SiNx, Ti, Cr, and the like.

- [c31] 31. A light emitting diode having an adhesive layer and a reflective layer, comprising at least:a substrate;a first reaction layer formed over the substrate;a adhesive layer formed over said first reaction layer;a second reaction layer formed over said adhesive layer;a reflective layer formed over said second reaction layer; and an LED stack formed over said reflective layer.
- [c32] 32. A light emitting diode having an adhesive layer and a reflective layer according to claim 31, further comprising a transparent conductive layer between said reflective layer and said LED stack.
- [c33] 33. A light emitting diode having an adhesive layer and a reflective layer according to claim 31, wherein said reflective layer is a reflective metal layer.
- [c34] 34. A light emitting diode having an adhesive layer and a reflective layer according to claim 31, wherein said reflective layer is a reflective oxide layer.
- [c35] 35. A light emitting diode having an adhesive layer and a reflective layer according to claim 33, wherein said reflective metal layer comprises at least a material selected from the group consisting of In, Sn, Al, Au, Pt, Zn, Ag, Ti,

Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, AuZn, and the like.

- [c36] 36. A light emitting diode having an adhesive layer and a reflective layer according to claim 34, wherein said reflective oxide layer comprises at least a material selected from the group consisting of  $\text{SiN}_x$ ,  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{MgO}$ , and the like.
- [c37] 37. A light emitting diode having an adhesive layer and a reflective layer according to claim 31, wherein said transparent adhesive layer comprises at least a material selected from the group consisting of polyimide (PI), benzocyclobutene (BCB), perfluorocyclobutane (PFCB), and the like.
- [c38] 38. A light emitting diode having an adhesive layer and a reflective layer according to claim 31, wherein said first reaction layer or said second reaction layer comprises at least a material selected from the group consisting of  $\text{SiN}_x$ , Ti, Cr, and the like.
- [c39] 39. A light emitting diode having an adhesive layer and a reflective layer, comprising at least:a reflective metal substrate;a first reaction layer formed over the reflective metal substrate;a transparent adhesive layer formed over said first reaction layer;a second reaction layer formed over said transparent adhesive layer; and an LED stack

formed over said second reaction layer.

- [c40] 40. A light emitting diode having an adhesive layer and a reflective layer according to claim 39, further comprising a transparent conductive layer between said second reaction layer and said LED stack.
- [c41] 41. A light emitting diode having an adhesive layer and a reflective layer according to claim 39, wherein said reflective metal substrate comprises at least a material selected from the group consisting of Sn, Al, Au, Pt, Zn, Ag, Ti, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, AuZn, and the like.
- [c42] 42. A light emitting diode having an adhesive layer and a reflective layer according to claim 39, wherein said transparent adhesive layer comprises at least a material selected from the group consisting of polyimide (PI), benzocyclobutene (BCB), perfluorocyclobutane (PFCB), and the like.
- [c43] 43. A light emitting diode having an adhesive layer and a reflective layer according to claim 39, wherein said first reaction layer or said second reaction layer comprises at least a material selected from the group consisting of SiNx, Ti, Cr, and the like.